CLAIMS

I CLAIM AS MY INVENTION:

1. A sensor assembly for sensing angular position of an object, the assembly comprising:

at least one magneto-sensing element having a first axis of rotation; and

a magnet having a second axis of rotation, wherein at least one of the magnet and the magneto-sensing element are rotatable relative to the other, wherein the respective axes of rotation of the magneto-sensing element and the magnet are non-coincident with respect to one another, and further wherein the magnet is magnetized along one of the following directions: an axial direction and a radial direction.

2. The sensor assembly of claim 1 wherein the at least one magneto-sensing element produces an output signal indicative of angular position in response to one of the following components of magnetic flux from the magnet: an axial flux component and a radial flux component.

3. The sensor assembly of claim 1 wherein said at least one magneto-sensing element comprises a pair of magneto-sensing elements co-planarly positioned 180 degrees apart around the magnet.

4. The sensor assembly of claim 3 further comprising a subtractor for differentially combining the respective output signals from the pair of magneto-sensing elements, wherein the resultant signal comprises a linearly varying signal indicative of angular position.

5. The sensor assembly of claim 3 further comprising a summer for additively combining the respective output signals from the pair of magneto-sensing elements, wherein the resultant signal comprises a sinusoidally varying signal indicative of angular position.

6. The sensor assembly of claim 1 wherein the magnet comprises a cylindrical magnet.

7. The sensor assembly of claim 6 wherein the cylindrical magnet comprises a bore concentrically situated relative to an outer surface of the cylinder.

8. The sensor assembly of claim 6 wherein the cylindrical magnet comprises a bore eccentrically situated relative to an outer surface of the cylinder.

9. The sensor assembly of claim 1 wherein the magnet comprises a cylindrical magnet magnetized along an axial direction and the at least one magneto-sensing element is positioned adjacent along the length of the cylinder to sense an axial flux component.

10. The sensor assembly of claim 1 wherein the magnet comprises a cylindrical magnet magnetized along an axial direction and the at least one magneto-sensing element is positioned adjacent along at least one of the bases of the cylinder to sense a radial flux component.

11. The sensor assembly of claim 1 wherein the magnet comprises a cylindrical magnet magnetized along a radial direction and the at least one magneto-sensing element is positioned adjacent along the length of the cylinder to sense a radial flux component.

12. The sensor assembly of claim 1 wherein the magnet comprises a cylindrical magnet magnetized along a radial direction and the at least one magneto-sensing element is positioned adjacent along at least one of the bases of the cylinder to sense an axial flux component.

13. The sensor assembly of claim 1 further comprising a shielding structure for partly enclosing the sensor assembly.

14. A sensor assembly for sensing angular position of an object, the assembly comprising:

at least one magneto-sensing element; and

a cylindrical magnet having an axis of rotation and a geometrical axis, wherein the magnet is rotatable relative to the at least one magneto-sensing element, wherein the geometric and rotation axes of the magnet are non-coincident with respect to one another, and further wherein the magnet is magnetized along one of the following directions: an axial direction and a radial direction.

15. The sensor assembly of claim 14 wherein the at least one magneto-sensing element produces an output signal indicative of angular position in response to one of the following components of magnetic flux from the magnet: an axial flux component and a radial flux component.

16. The sensor assembly of claim 14 wherein said at least one magneto-sensing element comprises a pair of magneto-sensing elements co-planarly positioned 180 degrees apart around the magnet.

17. The sensor assembly of claim 16 further comprising a subtractor for differentially combining the respective output signals from the pair of magneto-sensing elements, wherein the resultant signal comprises a linearly varying signal indicative of angular position.

18. The sensor assembly of claim 16 further comprising a summer for additively combining the respective output signals from the pair of magneto-sensing elements, wherein the resultant signal comprises a sinusoidally varying signal indicative of angular position.

19. The sensor assembly of claim 14 wherein the cylindrical magnet comprises a bore concentrically situated relative to an outer surface of the cylinder.

20. The sensor assembly of claim 14 wherein the cylindrical magnet comprises a bore eccentrically situated relative to an outer surface of the cylinder.

21. The sensor assembly of claim 14 wherein the magnet is magnetized along an axial direction and the at least one magneto-sensing element is positioned adjacent along the length of the cylinder to sense an axial flux component.

22. The sensor assembly of claim 14 wherein the magnet is magnetized along an axial direction and the at least one magneto-sensing element is positioned adjacent along one of the bases of the cylinder to sense a radial flux component.

23. The sensor assembly of claim 14 wherein the magnet comprises a cylindrical magnet magnetized along a radial direction and the at least one magneto-sensing element is positioned adjacent along the length of the cylinder to sense a radial flux component.

24. The sensor assembly of claim 14 wherein the magnet comprises a cylindrical magnet magnetized along a radial direction and the at least one magneto-sensing element is positioned adjacent along at least one of the bases of the cylinder to sense an axial flux component.

25. The sensor assembly of claim 14 further comprising a shielding structure for partly enclosing the sensor assembly.